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SIDER'S ARGUMENT FOR DIMENSIONALISM: A REFUTATION

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Sider's Argument for Four Dimensionalism: A Refutation

Synopsis:

This presentation is an attempt to refute both Sider's and Markosian's arguments. The concept of spatial extension plays an important, yet ignored in these arguments, in understanding time travel and its metaphysics. A proper understanding of the Elvis problem, respecting the notion of spatial extension, shall allow us to argue that if time can be traveled, then a version of 3D-ism has to be true.

Sider's Argument for Four Dimensionalism: A Refutation*

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Abstract

Consider the following: a fat and old Elvis (Presley) at his forties time-traveled to the past. He's faced with a slim and young version of himself in his twenties. The fat Elvis and the slim one can't be different people. Nonetheless, one is fat and the other slim. More puzzling is that Elvis is both fat and slim at the same time. How can this be? One and the same person exhibits what appears to be inconsistent characteristics? This is what we shall call the 'Elvis problem.'

Attempts to solve/resolve the problem touch one of the issues, at the heart of the discussion between the supporters of the three dimensionalism, and those for the four dimensionalism.¹ They disagree about the metaphysics of time, and the metaphysics of objects in time. Sider, one of the 4D-ists, argued that if time can be traveled, then a version of 4D-ism has to be true. Markosian objected to Sider's argument, and argued that if time can be traveled within a 4D world without having to face the Elvis problem, then time can be traveled within a 3D world without having to face the problem as well.

This presentation is our attempt to refute both arguments. The concept of spatial extension plays an important, yet ignored in these arguments, in understanding time travel and its metaphysics. A proper understanding of the Elvis problem, respecting the notion of spatial extension, shall allow us to argue that if time can be traveled, then a version of 3D-ism has to be true. If we accept that Elvis's temporal as well as spatial parts to spread about as Sider and Markosian do, then what do we also have to accept regarding the following question: how many of Elvis's temporal parts can a room accommodate at a given moment?

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¹'3D,' '4D' respectively hereafter

There was [a] study done by the Pew Research Center and Smithsonian Magazine back in February [2014], published in April. The study was about future technologies. And basically, they called up 1,001 Americans. . . They asked them what new technological advances they expected to see in the future, and what technological advances they wanted to see. . . [T]he very last question in the survey about future technologies, question 14—it was a short survey—was this. If there was one futuristic invention that you could own, what would it be? There was no multiple choice. This was an open-ended question. And off the tops of their heads, 9% of respondents, so roughly 1 out of 10 people, said they wanted some way to travel through time. . . One out of 10 came up with that on their own. That'd be roughly 30 million Americans. That's like the entire nation of Canada sitting around, wishing for a time machine. . . The desire for time travel, at 9%, ranked highest on the list, tied only with cures for diseases. . . People wanted time travel more than they wanted robot servants, which was 4%. . . More than they wanted world peace, a whopping 2%.²

But, is time travel possible?

1 The Elvis Problem

Elvis (Presley), the superstar's no more. His popularity dwindled, sinking faster with the introduction of Beatles. Elvis in his forties, with the abused fresh and the dissolute bone. He longed for days of returning to his fame. Elvis had enough money to burn, giving it a 'go' to a provocative, yet what appeared to be unrealistic proposal to travel time. A whopping million dollars was all it took:

The year of 1960, the year when Elvis started the drug abuse. Elvis wanted to travel to 1960, also the year of the superstar returned with the release of *It's now or never*. 'The now' at the time seemed to him the last now, but apparently it wasn't. The reality of things was better suited for the title *It's now and again* than *It's now or never* was.

The machine didn't seem convincing, but Elvis was eager to. . . Its door closed, and he was all alone in the dark. The machine's dark, narrow, small chamber forced Elvis to rethink about his decision to travel time: "I knew it. This junk doesn't work." When the door was opened, he's relieved at

²Transcript 539: The Leap, This American Life, originally aired Nov. 7, 2014

the thought of home, without being too disappointed. Then it happened. The young and ambitious Elvis was looking right at him.

So now we come the Elvis problem. It is the problem of making sense of the situation in which Elvis in his forties is looking right at Elvis in his twenties. Should we allow “them” to be one and the same person, then a different yet very difficult question should be raised as well. How can Elvis be both young and old, slim and fat, and so on, and so forth?

2 Four Dimensionalism and Change

The problem of change, a major topic in Greek metaphysics, has been raised eloquently by Melissus, a known disciple of Parmenides. He says the following:

And it cannot perish, or become greater, or be rearranged, or feel pain or distress. For if it experienced any of these, it would no longer be one. For if it became different, it is necessary that what is is not alike, but what previously was perishes, and what is not comes to be.³

The fragment seem to tell us that change is always change *of something*. The entity, undergoing change, must remain same all throughout change. Otherwise, there can't be change at all. If the entity changes, then it can't be the same entity. On the one hand, identity (or, the sameness) is required for there to be change; while, on the other hand, change changes the entity, i.e., the entity's no more. Thus no entities change.

Some, including 4D-ists, cast the above argument by Mellissus in terms of some variants of the Leibniz's law, “Indiscernibility of Identicals.” The resulting argument seems to be the following:

1. Michael (Jackson) in 1970 is young.
 2. Michael in 2000 is old.
 3. At least a characteristics is not shared between Michael in 1970 and him in 2000.
 4. Should there be a characteristics that is not shared, then there are two entities.
- ∴ Michael in 1970 and him in 2000 are two entities.

A typical 3D-ist solution to the problem of change is to consider characteristics as relativized by time. Perhaps then one and the same thing can

³Huggett 2010: 2

be said to show inconsistent characteristics. Michael, for instance, in 1970 exhibits 'young at 1970' characteristics, and him in 2000 'old at 2000.' Now what appeared to comprise an inconsistent set of characteristics is no more: 'young at 1970' and 'old at 2000' aren't incompatible to each other.

The 4D-ist objects to this manner of resolving the problem. She thinks that such a resolution to the problem requires each and every characteristics to be time-indexed, or at the very least force characteristics to time dependent. The 4D-ist maintains that characteristics aren't like that. She proposes instead to consider Michael to be an entity which begun at his birthday and which ended with his death: Michael at 1970 and Michael at 2000 are but (temporal) parts to Michael. In other words, the real (slim shady) Michael consists of many (temporal/spatial) parts. The upshot is that parts of the whole may exhibit inconsistent characteristics, and this poses no problem of change.

Such resolution's disheartening. Michael at Tokyo in 1970, and him at Seoul in 2000 have to be one and the same person. It seems much more reasonable to think that an individual persists through time, maintaining his/her identity. Nonetheless, this "reasonable" way of thinking about personal identity seems to be at the heart of the trouble change causes.

Perhaps Leibniz's Law and its particular rendition's at the root of the trouble. Consider the following rendition of the Law.

(LL)

Necessarily, (if $x = y$, then x, y share all characteristics)

LL is the claim about the inevitability of one (and the same) thing "sharing" all characteristics. It can be rendered as this. One (and the same) entity can't exhibit inconsistent characteristics at the same time. LL thus avoids the law to come in conflict with the possibility of change. In other words, to change is to exhibit inconsistent characteristics, but at different times.⁴ This is no problem indeed.

Philosophers mistook the very short fragment of Melissus' to indicate an impossibility of change perhaps because they rendered the Law the following LL*, rather than LL above.

(LL*)

Necessarily, (if $x = y$, then necessarily x, y share all characteristics)

LL and LL* implies as much: one (and the same) entity must share all characteristics. LL* goes further than LL does, and it suggests that it is also

⁴Rim 1995: 334-5

necessary that one (and the same) entity must have all characteristics that it has (all the time). In other words, LL* makes all characteristics of an entity essential. This seems absurd. The characteristics of being young, of being old, of being an excellent tennis player, of being a Rock star, and so on, and so forth. These aren't essential characteristics of any person at all. This is obvious. The lesson here is then that the Law shouldn't be rendered as LL*.⁵

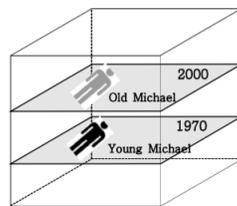
The 4D-ist objection to the 3D-ist proposal of relativizing characteristics to time in allowing change that is consistent with the Leibniz's Law seems to miss the mark. If characteristics aren't time-indexed, then an entity with any characteristics must have them essentially.

3 The Elvis Problem and Four Dimensionalism

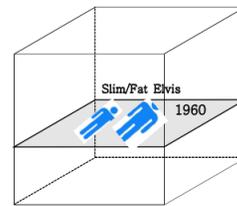
3.1 Sider's argument from the Elvis problem for four dimensionalism

The Elvis problem and the Michael problem aren't the same problem. The young one and the old one in Michael's case take up different time slots, while the young one and the old one in Elvis's supposedly occupy the same slot.

Michael case



Elvis case



Michael violates no Leibniz's Law: the young one and the old one aren't at the same time. Elvis appears to have violated the Law: the young one and the old one are simultaneously. Michael's the normal one, or of a garden-variety here. Elvis, on the other hand, is the difficult and perplexing one. A journey to deep metaphysical sea won't be of much help.

A typical 3D-ist resolution of the Elvis problem calls for our readiness of accepting time-indexed characteristics. Any sign of reluctance of accepting

⁵Rim 1995: 335

the time-honoring (or time sensitive) characteristics appears to result in an individual as a whole and its temporal parts. The trouble is to determine the lesser evil of the two alternatives.

We've noted above that Sider opted for the multiple temporal part alternative in resolving the Elvis problem. He considered it the only viable option in resolving the Elvis problem, and the temporal part alternative is available only to those who accept 4D-ism: any temporal part of an individual may take up two distinguishable stages of the individual. Indeed, a temporal part may have as many stages as the number of the visit the individual travels through time. To put it differently, a temporal part of an individual is the fused stages at any given moment. The 'person-stage' refers to a 'person-like part of the person's temporal part.' A temporal part of an individual at any moment typically (and ordinarily) *is* the individual's stage at the time, but if the individual travels through time, then the stages of the individual will only be a part of the temporal part.⁶

Sider's argument for 4D-ism exploits the supposed relationship between it and the temporal part resolution of the Elvis problem: 4D-ism is the only metaphysics of time and space that makes available the temporal part and temporal stage resolution of the problem. Only when one accepts 4D-ism, the slim one and the fat one can be said to be different stages of a temporal part of Elvis. This is the only manner in which, according to Sider, inconsistent characteristics can be exhibited at the same time. It is just like Elvis who has the slim left body, while he also has the fat right body.

According to Sider, then, the Elvis poses no problem for the 4D-ist. This can't be said of the 3D-ist, for accepting it commits her to this: the slim one and the fat one are two Elvis's. Sider's argument for 4D-ism may now be presented as follows:⁷

1. Time can be traveled only if the Elvis problem can be avoided.
 2. One may avoid the Elvis problem only when one accepts 4D-ism.
 3. Time can be traveled, indeed.
- ∴ One has to accept 4D-ism.

The same resource and a bit of change would prove 3D-ism to be false as well. That is, 3D-ism allows no one to travel through time because it fails to avoid the Elvis problem.

⁶Sider 2003: 101

⁷Sider 2003: 101–3

3.2 Markosian's objection to Sider's argument

Markosian rejected the premise (2) above.⁸ To appreciate Markosian's criticism of Sider's argument for 4D-ism, let us remind ourselves of Sider's notion of temporal part, and his notion of temporal stage. Elvis the superstar and Elvis nobody, according to Sider, are both Elvis stages. What's relation between Elvis stages and Elvis temporal parts? In the world where no one travels through time, Elvis stages are also Elvis temporal parts. This one may not confirm with an ordinary means of investigation in the world where people do travel through time: any of Elvis temporal part can have several Elvis stages, depending partly on the number of the travel he made through time. That is, according to Sider, a stage of Elvis is the "person-like spatial part of the temporal part of Elvis."

Elvis as a whole:

***t1*-temporal part** the slim-Elvis-stage & the fat-Elvis-stage

... & ...

***tn*-temporal part** the slim-Elvis-stage & the fat-Elvis-stage

... & ...

***tn+n*-temporal part** the slim-Elvis-stage & the fat-Elvis-stage

... & ...

For an *Elvis temporal part* at a given moment, there can be several Elvis temporal stages. These Elvis temporal stages can exhibit inconsistent characteristics.

Markosian *pace* Sider argued that if there is no Elvis problem in 4D world, then there won't be the problem in 3D world either. This is so because of the following: should one accept that the 4D world Elvis may take up identifiable Elvis temporal stages, one should also allow for the 3D world Elvis to take up identifiable Elvis temporal parts. The Elvis temporal stages and the Elvis temporal parts may exhibit inconsistent characteristics. That is to say, the Elvis problem no more on both 3D-ism and 4D-ism.

Markosian seems to have gone further than the above, and suggested that Elvis may take up more than one identifiable spatial parts as well. This is analogously so just as the physical body of Elvis' may take up the fat left hand and the slim right hand. The Elvis problem should be seen as the trouble caused by our inability to identify the fat Elvis and the slime one to be one (and the same) on the one hand, and also our inability to distinguish

⁸Markosian 2004: 8–10. He rejected that 3D-ism lacks resources to resolve the Elvis problem as well.

the fat one from the slim one, given the traveling Elvis. or not one and the same.

Whole-Elvis Elvis-slim-temporal-part & Elvis-fat-temporal-part⁹

This is indeed perplexing. On Markosian's proposal, Elvis seems to have four eyes (in the story told at the beginning of this presentation), two noses, and so on. Elvis is heavier than most of the adults as (in the above story about time travel) the slim one weighs 60 lb. and the fat one 90 lb., etc. Nevertheless, Markosian's resolution commits no logical fallacy: there doesn't seem to any violation of the Leibniz's Law.

4 Sider's and Markosian's Argument: An Appraisal

Sider argued that no one may travel through time under the assumption of 3D-ism. According to him, the Elvis problem ensues if the world is as 3D-ism describes it. If the choice is between 3D-ism and 4D-ism, and if one may travel through time, then the above provides sufficient ground for accepting 4D-ism. Markosian criticized Sider's argument by pointing out that the Elvis problem can be avoided on 4D-ism as well as 3D-ism. Elvis may take up inconsistent temporal parts, according to Markosian, as much as he may take up inconsistent temporal stages.

We shall argue that both Sider and Markosian are mistaken in their (rather lack of) treatment of spatial extension. This point should allow us to argue further that to travel through time, a 3D world is needed, not a 4D-world.

An individual takes up space. An individual thus may stand divided spatially over and over, and when the thing can't be divided spatially, it takes up a point-like "space". This point-like space doesn't take up space, for any individual that takes up space may be divided further. Now the 4D-ist considers an individual to take up temporal space. This allows the individual to be divided temporally over and over, and when the thing can't be divided temporally, it takes up an instance-like temporal "space." This instance-like temporal space doesn't take up temporal space, for any individual that take up temporal space may be divided further. The result is that the spatial part of the individual (in this final stage of division) doesn't take up space, notwithstanding it taking up temporal space. Again,

⁹E1 and E2, respectively. Elvis's person-like spatial part would be similar to this.

the temporal part of the individual (in this final stage of division) doesn't take up temporal space, notwithstanding it taking up spatial space.

An important point that has been skirted around is this: Both Sider and Markosian consider the slim Elvis and the fat one to be a "person-like spatial part." That is, both of them reject the two to be a "whole" as a whole. They merely are the "person-like" stage and the "person-like" part that take up space. Sider and Markosian part company on the issue about the fusion of E1 and E2. The fusion of E1 and E2, according to Sider, results in an Elvis-*t*-temporal part, while Markosian consider the fusion as resulting in an individual Elvis. Nevertheless, it is important to keep in mind that they agree that E1 and E2 to take up space.

Suppose that after the encounter, the fat Elvis in his forties traveled back to the future, having had a successful council against drug abuse. The inventor of time machine was due for Elvis' gratitude. In return to Elvis' appreciation of the hard work and successful journey through time, the inventor offered free of charge Elvis another trip to the past. Elvis, filthy rich though he was, wasn't going to pass up an opportunity for a free travel. He went back to 1960 that same spot. So there were three (instead of two that we begun with) person-like thingies: the fat Elvis (E1), the slim one (E2), and another fat one (E3). Three Elvis thingies, E1, E2, E3 all at the same spot, looking at one another tête-à-tête. Elvis—E3—went back to his then future again. He then made the same journey over and over again, attempting make sure that E1 doesn't take up drug. This trip to the past Elvis took as much time as it was allowed for him, and having had his popularity dwindled, finding time for the travel was no difficult task.

At some point of Elvis' visit to the past, the spot that he made an appearance would be full of "him." E1, E2, E3, ... E_n, the fusion amongst all of these, Sider would have to accept it to be an Elvis-*t*-temporal part. Now Sider, with Markosian, agreed that each and every one of these E's takes up space. We think it absurd to accept this. It doesn't seem to be intelligible for that many E's that take up space to share the same spot. Some of these E's perhaps can be cramped into the spot. But there would come a point in space where no more E can be allowed in.

Should there be an appropriate 4D-ist explanation of how there could be such spatial limit as to the number of E's it may accommodate. The trouble for the 4D-ist is that there isn't any such explanation. This is so because, 4D-ism treats all of the past, the present, and the future as real and genuine. It would be impossible to order E's visitation in time, either. The 4D-ist lacks resources to answer the question as this: "did E10 who began his trip in 1960 arrive at the spot before E11 who began in 1970 did?" We

think that the 4D-ist just can't answer the question.

The 3D-ist may adequately answer the question this way: All 10 E's (from E1 to E10) may take up the same space, but that's just have many the spot would accommodate. Beginning with E11, E's won't be taking up the spot as there just isn't any space left to be filled. This is so because the 3D-ist may take advantage of the 3D idea, according to which even time travel take place in order. So we think that it is 3D-ism, rather than 4D-ism, that enable us to travel through time.

5 Concluding Remarks

The above section concludes our presentation. We think that we have established that both Sider and Markosian mistook the nature of the Elvis problem. Their mistake has to do with them ignoring an aspect of their theories: the Elvis problem has to be understood by allowing E's to take up space. One visit to the past (or to the future) is all it takes to be hooked on time travel, but taking advantage of time machine once, is one time too many as it happens. Visits to the past never is free (of charge) because the space won't accommodate all time travelers.

Should there be Elvis the travel agent, the spot would fill up immediately. To avoid this problem: some Elvis's may not travel through time, traveling in a (temporal) order. 4D-ism allows for no order of time travels. That is, traveling through time is possible only when 3D-ism is true.

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